CONTRACT TIME DETERMINATION

DEFINITIONS

Calendar Day: Any day shown on the calendar beginning and ending at midnight.

Working Day: A calendar day during which major construction operations could proceed for 6 hours or more. The following days are not counted as working days: Saturday, Sundays, holidays, and the period from December 15 to March 15, both dates inclusive.

Controlling Item(s): Contract work item(s) that (a) is large enough in volume, (b) requires a lengthy period for completion, or (c) is on the critical path of a precedence diagram.

Completion Date: The contractor must have all (essential) work completed by a specific date without regard for working days.

Production Rate: The amount constructed over a specified time period.

CONTRACT TIME DETERMINATION

The validity of the contract time included in contracts is extremely critical. Contracts that specify too few working days or a short time period may:

- Encourage higher bids
- Eliminate some qualified contractors
- Increase number of time overruns and contractor claims
- Increase bond costs for contractors
- Encourage good management and thus high production
- Lower administration and engineering costs

Contracts that specify an excessive number of working days or a long time period may:

- Encourage lower bid prices
- Permit both high and low production contractors to bid on project
- Allow contractors to stop all work on projects for extended periods.
- Encourage contractors to bid more work than they can handle in a timely manner
- Subject the public to added inconvenience by forcing travel on a roadway where safety is less than desirable.
- Reduce the bonding capacity of contractors
- Discourage innovative management and/or construction techniques
- Increase administration and engineering costs

Several different procedures can be used to estimate the number of working days or calendar days needed to complete construction projects. Some of these techniques are simple and depend on individual judgment. Others are more complicated, drawing heavily on past data accumulated by the department and possibly using a

computer program to develop time schedules. Each of these procedures, however, depends on first developing a progress schedule.

DISTRICT ROLE

District Design personnel should develop the progress schedule. This should be developed late in the design phase of the project. Preferably after the quantities have been completely tabulated. District Construction personnel should review this schedule prior to submitting it to the Support Center. A suggested time for review would be during the final field check for the project when both divisions can discuss the length of contract time.

A. Developing A Progress Schedule

The progress schedule shows the items of work and the durations associated with the chosen production rates. The time to complete each controlling item of work included in the progress schedule is computed based on the production rates applicable to that project. Items should be arranged by chronological sequence of construction operations. Minor items that may be performed concurrently with controlling items or that can be completed in a comparatively short length of time need not be analyzed.

In determining a progress schedule it should be remembered that the start and ending dates for each controlling item need to be based on the earliest date on which work on that time will begin and how long it will take to complete. The earliest start date for each activity will be determined by the completion of the activities which precede it, allowing for the fact that some activities can begin before the preceding activity is entirely completed.

Along with the time established for all controlling items, additional time should be allowed in the contract for initial mobilization and final cleanup. It should be remembered there are seasonal limitations for some construction activities and consideration should be made in the progress schedule (i.e. asphalt paving).

1. Adapting Production Rates To a Particular Project

Before time durations for individual work items can be computed, certain project specific information should be determined and some management decisions made. A determination should be made relative to the urgency of the completion of the proposed project. The traffic volumes affected as well as the effect of detours should be analyzed. The size and location of the project should be reviewed as well as the effects of staging, working double shifts, and the feasibility of night work as well as restrictions on closing lanes and other restrictions set out in the traffic control plan.

Also, the availability of material for controlling items of work should be investigated. For example, it might be appropriate to consider the need for multiple crews on a specific item to expedite the completion when there are exceptionally large quantities or when there is a large impact on traffic.

Beginning in April of 1993, and again in December of 1997, a survey of the production rates in all ten districts and the AGC was made, and the results tabulated (see attached sheets).

The low production rates category would include those projects which may include some of the following characteristics:

- heavy traffic
- urban area
- tight working conditions
- complex staging
- mostly hand work or "piece-work"
- not readily available material
- reconstruction
- difficult earthwork (poor soil type; steep grading; truck haul)
- non-standard construction (variable pavement widths, etc.)

The average production rates category would include those projects which may include some of the following characteristics:

- light traffic
- rural area
- simple staging
- mostly machine work (i.e. slip-form paving)
- readily available material
- new construction or relocation
- easy earthwork (good soil type; scraper haul)
- standard construction (uniform pavement widths, etc.)

The high production rates or "accelerated" category would include critical types of projects where an efficient contractor is working more than 8 hours per day, more than 5 days per week, and possibly with additional workers.

The production rates used should be based on the desired level of resource commitment (labor, equipment, etc.) deemed practical given the physical limitations of the project.

2. Other Factors Which Influence Contract Time

In addition to production rates, the following items should be considered when determining contract time:

(a) Effects of maintenance of traffic requirements on scheduling and the sequence of operations.

(b) Curing time and waiting periods between successive paving courses or between concrete placement operations, as well as specified embankment settlement periods.

(c) Seasonal limitations for certain items which affect the number of days the contractor will be able to work as well as production rates.

(d) Conflicting operations of adjacent projects, both public and private.

(e) Review time for falsework plans, shop drawings, post-tensioning plans, mix designs, etc.

(f) Time for fabrication of structural steel, signal mast arms, and other specialty items.

(g) Coordinate with utilities.

(h) Time to obtain permits.

(i) The effect of permit conditions and/or restrictions.

(j) Restrictions for nighttime and weekend operations.

(k) Time of the year of the letting as well as duration of the project.

(l) Location.

(m) Delivery of materials

(n) Coordination with major community events and holidays.

(o) Commitments which have been made.

(p) Other pertinent items.

B. Procedures For Setting Contract Time

Once the progress schedule is developed, then a decision must be made on which procedure to use for setting the contract time. The working-day and calendar-day methods have an advantage over the completion-date method in that the contractor is not liable for circumstances beyond his control; however, each day that is charged must be carefully documented. In setting contract time it is recommended that a completion date be applied only when project completion is critical or when a large volume of traffic is affected.

Management should be involved in identifying the projects that must be completed at the earliest practical date. Procedures which would accelerate project completion, such as a "liquidated Damages Specified" or "Acceleration of Work" clause, should be considered when construction will affect traffic substantially or when project completion is crucial. It should be remembered that while high traffic volumes can greatly delay a contractor's work, if a contractor were to initiate double shifts to complete

a project by an unreasonable date, greater exposure to hazards and traffic disruptions might result than would occur with the expeditious continuation of work with moderate use of overtime.

1. Working Days Based on Quantity and Production Rates

Working days which are developed from production rates for work items are usually based on experience and past data from completed projects. The controlling items are used as the primary basis for specifying contract time.

Large, complicated projects requiring extensive coordination of materials, equipment, personnel, and administrative support can best be handled by means of work-flow techniques such as CPM (Critical Path Method).

2. Completion Date Based on Construction Season Limits

Time limits are set at the end of the construction season for certain surfacing and paving projects. This method is satisfactory when:

(a) the projects are awarded early in the season

(b) a sufficient time is available to finish the project before the completion date

(c) a large number of projects is not awarded to a single contractor

(d) materials are readily available

(e) the contractor is held responsible for the expense of maintaining the project over the winter or paying liquidated damages

Example: Leveling course jobs, let in the spring, are assigned a completion date of October 1, which is the last day asphalt may be placed by specification.

3. Completion Date Based on Stage Construction

Some projects or portions of projects must be completed by a specific date to allow access by subsequent contractors to adjoining projects. Delays in completion of the project can result in considerable claims for delay costs by the subsequent contractor. Therefore a specific completion date associated with a sufficiently high rate for liquidated damages is advisable. A realistic completion date must be assigned or the final costs will outweigh the desired benefits.

4. Completion Date Set by Contractor

Contractors enter a bid and Calendar Days. The product of the number of calendar days and the road user cost is then added to the amount bid for work items and the total is used to determine the

low bidder. This procedure is known as an Acceleration of Work Clause or "A plus B" bidding. It should be used sparingly and only when the quick project completion is critical.

SUPPORT CENTER ROLE

One objective in the determination of a time period is to encourage a reasonable number of contractors to bid on the project. This allows for competitive bidding and results in lower bid prices. Knowledge of the capabilities and work loads of the contractors that normally bid each type of work is required.

The Support Center will review the district's working day study so that these factors are considered, as well as to insure that production rates and other considerations are applied uniformly throughout the state. The Support Center will also review the district's progress schedule for coordination with the progress schedule supplied by the Bridge Division, or for any projects which are let in combination. The Support Center will reserve the right to adjust the working day counts as necessary for the reasons previously stated.

CONCLUSIONS AND RECOMMENDATIONS

In setting contract time limits, a decision must be made on whether to have the construction project completed by a specific date at any cost, or to have the project completed in a reasonable period of time at a reasonable cost. Once specified, contract time becomes a contractual condition, and as such, affects both the bidding and the administration of the project.

An essential element of MoDOT's procedure should be the monitoring of existing projects to determine if the contract times being specified are appropriate. As a part of this process, updates and changes should be made as determined to be necessary. In addition, good communication between District Design and District Construction and the Bridge Division is essential in preparing realistic working day counts.

When establishing a new time-estimation procedure or modifying the existing procedure, the performance of the existing procedure should be carefully monitored both for projects with major time overruns and for projects completed much earlier than the contract date. It is also important to identify projects that were completed on time, even though work was not continuous. Special attention should be given to identifying items of work that must be completed in specific sequence. Although the experience of other organizations can be useful in establishing estimating procedures, MoDOT should use its own data and historical files to develop new methods or to check the validity of existing procedures.

PRODUCTION RATES

DECEMBER 1997

EARTHWORK

ITEM	UNIT		DIST 1	DIST 2	DIST 3	DIST 4	DIST 5	DIST 6	DIST 7	DIST 8	DIST 9	DIST 10	AGC	AVG
CLEARING & GRUBBING	ACRES/DAY	LOW	0.5	1.0	0.5	0.5	2.0	0.3	1.3	2.0	2.0	1.3	2.0	1.2
		AVERAGE	1.0	3.0	4.0	5.0	6.0	3.2	1.3	4.0	4.0	2.9	3.0	3.4
		HIGH	1.6	4.0	11.0	10.0	16.0	6.0	1.3	6.0	6.0	3.3	4.0	6.3
COMMON EXCAVATION - PLASTIC SOILS	CY/DAY	LOW	780.0	45.0	900.0	1000.0	1133.0	93.0	500.0	1500.0	1400.0	2025.0	2500.0	1079.6
		AVERAGE	2500.0	340.0	2500.0	2000.0	3222.0	1297.0	1000.0	3750.0	2500.0	4100.0	3000.0	2382.6
		HIGH	3030.0	840.0	5000.0	2700.0	7333.0	2500.0	1500.0	6000.0	3500.0	5250.0	3500.0	3741.2
COMMON EXCAVATION - GRANULAR SOILS	CY/DAY	LOW	1000.0	1000.0	1000.0	1000.0	3000.0	50.0	557.0	1000.0	1650.0	1233.0	3000.0	1317.3
		AVERAGE	4000.0	3500.0	2000.0	2000.0	4000.0	1275.0	2394.0	2750.0	3000.0	4500.0	3500.0	2992.6
		HIGH	10000.0	4000.0	5000.0	7000.0	8000.0	2500.0	4231.0	4500.0	4300.0	7333.0	4000.0	5533.1
CHANNEL EXCAVATION	CY/DAY	LOW	100.0	250.0	100.0	100.0	100.0	50.0	--	300.0	400.0	300.0	400.0	210.0
		AVERAGE	500.0	750.0	800.0	200.0	400.0	275.0	200.0	650.0	950.0	1000.0	600.0	575.0
		HIGH	1000.0	1000.0	1500.0	300.0	700.0	500.0	--	1000.0	1350.0	3000.0	800.0	1115.0
ROCK EXCAVATION - BLASTING	CY/DAY	LOW	500.0		100.0	1000.0	1900.0	300.0	250.0	700.0	300.0	525.0	3000.0	857.5
		AVERAGE	2000.0	N / A	3000.0	2000.0	3500.0	900.0	500.0	1850.0	1050.0	850.0	4500.0	2015.0
		HIGH	3500.0		7000.0	3000.0	8000.0	1500.0	750.0	3000.0	1750.0	1800.0	6000.0	3630.0
ROCK EXCAVATION - NON BLASTING	CY/DAY	LOW	500.0		1000.0	500.0	1500.0	14.0	2750.0	1500.0	1050.0	200.0	200.0	921.4
		AVERAGE	2000.0	N / A	2500.0	900.0	5000.0	1207.0	3000.0	3250.0	1850.0	600.0	300.0	2060.7
		HIGH	3500.0		3000.0	1200.0	7000.0	2400.0	4000.0	5000.0	2500.0	2300.0	400.0	3130.0
EMBANKMENT IN PLACE	CY/DAY	LOW	1000.0	2000.0	2700.0	200.0	1250.0	2413.0	750.0	1000.0	700.0	400.0	1000.0	1219.4
		AVERAGE	4000.0	6500.0	6167.0	400.0	5500.0	2240.0	2400.0	2500.0	3500.0	4000.0	3000.0	3655.2
		HIGH	10000.0	8000.0	8383.0	800.0	7500.0	9096.0	3400.0	5000.0	8000.0	7500.0	4000.0	6516.3
CLASS 3 EXCAVATION	CY/DAY	LOW	32.0	40.0	50.0	50.0	40.0	1.0	12.0	200.0	50.0	48.2	200.0	65.7
		AVERAGE	65.0	85.0	150.0	150.0	150.0	182.0	61.0	850.0	170.0	109.2	300.0	206.6
		HIGH	81.0	156.0	275.0	400.0	425.0	363.0	158.0	1500.0	260.0	173.2	400.0	381.0
CLASS 3 EXCAVATION IN ROCK	CY/DAY	LOW		25.0	50.0	25.0	500.0	2.0		100.0	22.0	10.0	200.0	103.8
		AVERAGE	N / A	50.0	75.0	100.0	750.0	73.0	N / A	500.0	50.0	25.0	300.0	213.7
		HIGH		75.0	100.0	150.0	1000.0	144.0		900.0	70.0	50.0	400.0	321.0

BASE CONSTRUCTION

ITEM	UNIT		DIST 1	DIST 2	DIST 3	DIST 4	DIST 5	DIST 6	DIST 7	DIST 8	DIST 9	DIST 10	AGC	AVG
AGGREGATE BASE	TONS/DAY	LOW		1010.0	1500.0	200.0	1500.0	14.0	83.0	500.0	500.0	1500.0	450.0	725.7
		AVERAGE	N / A	1534.0	2000.0	600.0	2750.0	424.0	488.0	1500.0	1250.0	2000.0	980.0	1352.6
		HIGH		1808.0	2500.0	3000.0	3750.0	834.0	893.0	2500.0	2000.0	2300.0	1706.0	2129.1
AGGREGATE BASE, 4"	SY/DAY	LOW	1000.0	1528.0	2000.0	1000.0	1000.0	50.0	3774.0	2500.0	3250.0	5314.6	3000.0	2219.7
		AVERAGE	2000.0	5783.0	3000.0	2500.0	2800.0	5025.0	6886.0	8250.0	6000.0	9840.0	6000.0	5280.4
		HIGH	2300.0	13093.0	8000.0	5000.0	4333.0	10000.0	9998.0	14000.0	8500.0	17350.2	9000.0	9234.0
PLACING ROCK BASE (2 FT. THICK)	SQ YD/DAY	LOW	500.0		100.0		800.0	50.0		300.0	1000.0			458.3
		AVERAGE	850.0	N / A	750.0	N / A	1300.0	925.0	N / A	1150.0	1500.0	N / A	N / A	1079.2
		HIGH	950.0		1500.0		2700.0	1800.0		2000.0	2000.0			1825.0

BITUMINOUS PAVING

ITEM	UNIT		DIST 1	DIST 2	DIST 3	DIST 4	DIST 5	DIST 6	DIST 7	DIST 8	DIST 9	DIST 10	AGC	AVG
BITUMINOUS / ASPHALTIC CONCRETE PLACEMENT	TONS/DAY	LOW	1200.0	462.0	500.0	200.0	850.0	20.0	415.0	800.0	760.0	358.3	50.0	510.5
		AVERAGE	4000.0	1863.0	1000.0	1500.0	1850.0	1410.0	1412.0	1900.0	178.0	1750.0	1042.0	1627.7
		HIGH	4300.0	3019.0	2000.0	3000.0	3750.0	2800.0	2296.0	3000.0	263.0	2223.3	2862.0	2683.0
COLD MILL BITUMINOUS SURFACE (3" OR LESS)	SY/DAY	LOW	445.0	4055.0	2000.0	2000.0	5000.0	622.0	--	3000.0	4500.0	6031.0	2500.0	3015.3
		AVERAGE	2500.0	15362.0	5000.0	14000.0	11000.0	12311.0	225.0	7500.0	9500.0	8080.0	5000.0	8225.3
		HIGH	3000.0	29050.0	10000.0	27000.0	16000.0	24000.0	8078.0	12000.0	1500.0	13843.3	10000.0	14042.8
BITUMINOUS CONCRETE BASE WIDENING	TONS/DAY	LOW	55.0	1201.0	600.0	500.0	200.0	50.0	--	200.0	500.0	500.0	400.0	420.6
		AVERAGE	55.0	1652.0	800.0	1400.0	350.0	525.0	1500.0	850.0	1200.0	2325.0	1200.0	1077.9
		HIGH	55.0	2402.0	1000.0	1600.0	500.0	1000.0	--	1500.0	1500.0	3600.0	2000.0	1515.7
BITUMINOUS PAVEMENT REMOVAL	SY/DAY	LOW	1000.0	1000.0	4000.0	1000.0	1800.0	1325.0	--	1500.0		1000.0		1578.1
		AVERAGE	7000.0	5000.0	7833.0	1550.0	3750.0	1765.0	2500.0	4000.0	N / A	4000.0	N / A	4155.3
		HIGH	7000.0	8000.0	12000.0	3000.0	800.0	3290.0	--	6500.0		6000.0		5823.8

PRODUCTION RATES

CONCRETE PAVING

ITEM	UNIT		DIST 1	DIST 2	DIST 3	DIST 4	DIST 5	DIST 6	DIST 7	DIST 8	DIST 9	DIST 10	AGC	AVG
REINFORCED CONCRETE PAVEMENT 8" TO 11"	SY/DAY	LOW	1000.0	1000.0	2465.0	100.0	550.0	3300.0	700.0	1250.0	2000.0	2000.0	1700.0	1460.5
		AVERAGE	10500.0	10000.0	10520.0	1600.0	10500.0	3945.0	6321.0	8000.0	14000.0	10000.0	9000.0	8580.5
		HIGH	14000.0	14000.0	17060.0	10000.0	12000.0	7930.0	7462.0	12000.0	20000.0	13000.0	11200.0	12604.7
NON-REINFORCED CONCRETE PAVEMENT 8" TO 11" (15 FT. JOINTS)	SY/DAY	LOW	1000.0	1000.0	2717.0	1500.0	7000.0	500.0	282.0	1000.0	5300.0	1600.0	1800.0	2154.5
		AVERAGE	10500.0	10000.0	11667.0	3000.0	10560.0	4500.0	6321.0	6500.0	11500.0	4200.0	9500.0	8022.5
		HIGH	14000.0	14000.0	17060.0	5500.0	14000.0	8500.0	7462.0	12000.0	15000.0	6800.0	12000.0	11483.8
REINFORCED CONCRETE PAVEMENT 12" TO 14"	SY/DAY	LOW			1691.0	100.0	450.0	2370.0			1500.0		1200.0	1218.5
		AVERAGE	N / A	N / A	5976.0	1600.0	3500.0	2780.0	N / A	N / A	10000.0	N / A	6200.0	5009.3
		HIGH			8336.0	10000.0	5000.0	4960.0			13000.0		7300.0	8099.3
NON-REINFORCED CONCRETE PAVEMENT 12" TO 14" (15 FT. JOINTS)	SY/DAY	LOW	800.0	62.0	5000.0	1500.0	6000.0	300.0	223.0	1000.0	5300.0	2589.0	1700.0	2224.9
		AVERAGE	10000.0	2816.0	7000.0	2600.0	10000.0	5630.0	5353.0	6500.0	11500.0	7166.6	7350.0	6901.4
		HIGH	14000.0	5438.0	9000.0	5000.0	12000.0	10960.0	14550.0	12000.0	15000.0	11850.0	9625.0	10856.6
COLD MILL CONCRETE SURFACE (3" OR LESS)	SY/DAY	LOW	420.0		20.0	5000.0	2000.0	200.0		1500.0	200.0		1000.0	1292.5
		AVERAGE	7260.0	N / A	35.0	10000.0	6000.0	1350.0	N / A	4750.0	500.0	N / A	2000.0	3986.9
		HIGH	7260.0		50.0	15000.0	12000.0	2500.0		8000.0	800.0		3500.0	6138.8
CONCRETE PAVEMENT REPAIR	SY/DAY	LOW	343.0	141.0	30.0	60.0	175.0	20.0	225.0	100.0	90.0	47.3	100.0	121.0
		AVERAGE	490.0	249.0	90.0	150.0	250.0	198.0	370.0	200.0	77.0	75.0	250.0	218.1
		HIGH	595.0	330.0	150.0	300.0	350.0	375.0	450.0	300.0	52.0	103.3	400.0	309.6
PAVEMENT REMOVAL	SY/DAY	LOW	200.0	1067.0	800.0	300.0	250.0	500.0		500.0	800.0	105.0	1000.0	552.2
		AVERAGE	1000.0	3800.0	1000.0	500.0	1500.0	1550.0	N / A	1000.0	2100.0	262.5	2000.0	1471.3
		HIGH	2000.0	8800.0	1200.0	1000.0	3000.0	2600.0		1500.0	2650.0	365.0	4500.0	2761.5
VERTICAL SAW CUT (FULL DEPTH)	LF/DAY	LOW	1241.0	519.0	50.0	100.0	500.0	36.0	670.0	200.0	550.0	138.3	500.0	409.5
		AVERAGE	1550.0	970.0	100.0	600.0	750.0	668.0	1440.0	350.0	950.0	400.0	1250.0	820.7
		HIGH	1758.0	1348.0	200.0	1500.0	1500.0	1300.0	2960.0	500.0	1400.0	493.3	1625.0	1325.8
DIAMOND GRINDING (CONCRETE PAVEMENT)	SQ.YD/DAY	LOW			150.0		3000.0	50.0			260.0	1600.0		1012.0
		AVERAGE	N / A	N / A	300.0	N / A	9000.0	275.0	N / A	N / A	717.0	2000.0	N / A	2458.4
		HIGH			400.0		14000.0	500.0			1025.0	2400.0		3665.0

PRODUCTION RATES

MISCELLANEOUS CONSTRUCTION

ITEM	UNIT		DIST 1	DIST 2	DIST 3	DIST 4	DIST 5	DIST 6	DIST 7	DIST 8	DIST 9	DIST 10	AGC	AVG
CURB AND GUTTER	LF/DAY	LOW	48.0	200.0	75.0	100.0	200.0	30.0	56.5	50.0	150.0	90.0	200.0	109.0
		AVERAGE	104.0	600.0	150.0	400.0	600.0	90.0	487.0	475.0	230.0	145.0	1000.0	389.2
		HIGH	556.0	1500.0	250.0	2000.0	900.0	320.0	918.0	900.0	316.0	200.0	2000.0	896.4
CURB AND GUTTER REMOVAL	LF/DAY	LOW	200.0	300.0	242.0	100.0	550.0	900.0	--	200.0	300.0	150.0	850.0	379.2
		AVERAGE	500.0	1200.0	433.0	300.0	1250.0	954.0	500.0	450.0	500.0	500.0	2500.0	826.1
		HIGH	1200.0	2000.0	833.0	600.0	1750.0	2325.0	--	800.0	700.0	750.0	3100.0	1405.8
CONCRETE PAVED APPROACH	SY/DAY	LOW	45.0	56.0	50.0	30.0	730.0	11.0	80.2	150.0	83.0	102.5	50.0	126.2
		AVERAGE	50.0	162.0	200.0	100.0	780.0	100.0	113.0	225.0	228.0	184.3	100.0	203.8
		HIGH	70.0	265.0	400.0	200.0	350.0	300.0	175.0	300.0	240.0	264.0	200.0	251.3
CONCRETE MEDIAN	SY/DAY	LOW		100.0	15.0	25.0	250.0	150.0	--	100.0	200.0	70.0	50.0	106.7
		AVERAGE	N / A	250.0	20.0	125.0	350.0	175.0	200.0	225.0	275.0	105.0	100.0	182.5
		HIGH		500.0	25.0	300.0	500.0	300.0	--	350.0	400.0	190.0	175.0	304.4
CONCRETE MEDIAN STRIP (4 FT. WIDE)	LF/DAY	LOW				50.0	1000.0	40.0		100.0	150.0		50.0	231.7
		AVERAGE	N / A	N / A	N / A	100.0	3000.0	220.0	N / A	225.0	262.0	N / A	100.0	651.2
		HIGH				200.0	5000.0	650.0		350.0	375.0		175.0	1125.0
CONCRETE TRAFFIC BARRIER TYPE A (CAST IN PLACE)	LF/DAY	LOW				50.0	100.0	100.0		100.0	75.0	200.0		104.2
		AVERAGE	N / A	N / A	N / A	1500.0	600.0	200.0	N / A	425.0	287.0	1550.0	N / A	760.3
		HIGH				2600.0	1000.0	400.0		750.0	450.0	2600.0		1300.0
CONCRETE TRAFFIC BARRIER TYPE C (CAST IN PLACE)	LF/DAY	LOW					100.0	100.0		300.0	50.0			137.5
		AVERAGE	N / A	N / A	N / A	N / A	600.0	1633.0	N / A	600.0	75.0	N / A	N / A	727.0
		HIGH					1000.0	2965.0		900.0	100.0			1241.3
GUARD RAIL	LF/DAY	LOW	750.0	238.0	200.0	100.0	300.0	62.5	58.0	400.0	450.0	83.3	200.0	258.3
		AVERAGE	1200.0	563.0	500.0	200.0	500.0	200.0	187.0	700.0	775.0	189.3	400.0	492.2
		HIGH	1700.0	963.0	800.0	500.0	1250.0	4402.0	333.0	1000.0	1100.0	262.5	800.0	1191.9
GUARD RAIL REMOVAL	LF/DAY	LOW	800.0	277.0	1000.0	100.0	500.0	200.0	12.0	600.0	1000.0	212.5	400.0	463.8
		AVERAGE	1250.0	277.0	2000.0	200.0	1300.0	500.0	256.0	1000.0	1750.0	250.0	600.0	853.0
		HIGH	1750.0	277.0	3000.0	500.0	400.0	2000.0	500.0	1400.0	2500.0	275.0	1000.0	1236.5
GUARD RAIL - BREAKAWAY CABLE TERMINAL	EACH/DAY	LOW	1.0	2.0	3.3	2.0	1.0	3.0	1.0	1.5	2.0	2.0		1.9
		AVERAGE	4.0	8.0	5.7	6.0	3.0	5.0	3.0	2.5	4.0	6.0	N / A	4.7
		HIGH	8.0	10.0	7.7	10.0	4.5	8.0	3.0	3.5	6.0	8.0		6.9
PLACING ROCK BLANKET	CU.YD/DAY	LOW	230.0	110.0	200.0	50.0	100.0	4.0	162.5	80.0	125.0	68.8	250.0	125.5
		AVERAGE	300.0	223.0	700.0	140.0	200.0	200.0	168.8	200.0	225.0	247.5	500.0	282.2
		HIGH	320.0	317.0	1000.0	200.0	350.0	400.0	175.0	320.0	325.0	385.0	650.0	403.8
PLACING ROCK DITCH LINER	CU.YD/DAY	LOW	200.0	61.0	50.0	100.0	75.0	50.0	500.0	100.0	150.0	150.0	175.0	146.5
		AVERAGE	200.0	140.0	100.0	200.0	180.0	200.0	500.0	300.0	275.0	525.0	--	262.0
		HIGH	200.0	240.0	150.0	2000.0	330.0	400.0	500.0	500.0	400.0	600.0	400.0	520.0
RCP CULVERTS LESS THAN 36" IN DIAMETER	LF/DAY	LOW	45.0	61.0	50.0	100.0	125.0	152.0	44.0	100.0	100.0	87.3	200.0	96.8
		AVERAGE	105.0	137.0	150.0	200.0	200.0	415.0	49.0	200.0	216.0	117.5	250.0	185.4
		HIGH	190.0	213.0	300.0	400.0	375.0	679.0	54.0	400.0	330.0	175.0	300.0	310.5
RCP CULVERTS 36"-60" IN DIAMETER	LF/DAY	LOW	50.0	40.0	50.0	50.0	100.0	10.0	6250.0	100.0	108.0	50.0	100.0	628.0
		AVERAGE	150.0	91.0	100.0	200.0	200.0	52.0	100.0	150.0	175.0	143.3	125.0	135.1
		HIGH	300.0	160.0	120.0	400.0	300.0	140.0	138.0	300.0	260.0	145.5	150.0	192.1
RCP CULVERTS GREATER THAN 60" IN DIAMETER	LF/DAY	LOW				25.0	75.0	75.0			75.0	80.0	50.0	63.3
		AVERAGE	N / A	N / A	N / A	100.0	150.0	120.0	N / A	N / A	150.0	145.0	75.0	123.3
		HIGH				200.0	250.0	145.0			225.0	205.0	100.0	187.5
GEOCOMPOSITE PAVEMENT EDGE DRAIN	LF/DAY	LOW		100.0	433.0	200.0	1000.0	100.0			1000.0		500.0	476.1
		AVERAGE	N / A	200.0	800.0	400.0	2500.0	250.0	N / A	N / A	2000.0	N / A	5000.0	1592.9
		HIGH		400.0	1150.0	3000.0	5000.0	350.0			4000.0		7500.0	3057.1
LONGITUDAL PIPE AGGR. UNDERDRAIN	LF/DAY	LOW	60.0	60.0	500.0	50.0	500.0	1918.0	555.0	50.0	1930.0	10058.6	200.0	1443.8
		AVERAGE	200.0	1293.0	2000.0	150.0	1500.0	2228.0	4433.0	100.0	3000.0	14943.1	1000.0	2804.3
		HIGH	500.0	2255.0	3000.0	300.0	3000.0	2537.0	7240.0	175.0	4160.0	19827.7	1500.0	4045.0
DROP INLETS	EACH/DAY	LOW	2.0	2.0	1.0	2.0	2.0	2.0	1.0	1.0	3.0	1.0	2.0	1.7
		AVERAGE	5.0	4.0	2.0	4.0	3.0	5.0	3.5	6.0	5.0	2.3	2.5	3.8
		HIGH	10.0	7.0	4.0	7.0	4.0	8.0	6.0	8.0	7.0	3.5	3.0	6.1
MANHOLES	EACH/DAY	LOW	1.0	1.0	1.0	1.0	2.0	2.0	2.0	1.0	4.0	1.0	0.5	1.5
		AVERAGE	2.0	3.0	2.3	2.0	3.5	4.0	4.0	2.5	6.0	5.0	2.0	3.3
		HIGH	3.0	5.0	4.3	3.0	5.0	7.0	6.0	4.5	8.0	7.0	4.0	5.2

PRODUCTION RATES

MISCELLANEOUS CONSTRUCTION (CONT.)

ITEM	UNIT		DIST 1	DIST 2	DIST 3	DIST 4	DIST 5	DIST 6	DIST 7	DIST 8	DIST 9	DIST 10	AGC	AVG
PREFORMED MARKING TAPE	LF/DAY	LOW	8.7	750.0	3000.0	3000.0	1500.0	300.0	700.0	500.0	7650.0	150.0	600.0	1650.8
		AVERAGE	26.0	2500.0	5000.0	4500.0	4500.0	5700.0	2100.0	2000.0	7500.0	250.0	--	3407.6
		HIGH	26.0	4000.0	7000.0	8000.0	8000.0	10240.0	3500.0	3500.0	16500.0	500.0	1500.0	5706.0
PAINT STRIPE	LF/DAY	LOW	14.0	600.0	500.0	6000.0	4000.0	1840.0	5000.0	2000.0	14000.0	10534.0	20000.0	5862.5
		AVERAGE	46.0	4400.0	15000.0	15000.0	8000.0	39850.0	10000.0	5000.0	38750.0	13877.5	50000.0	18174.9
		HIGH	46.0	1200.0	30000.0	25000.0	15000.0	66800.0	35000.0	8000.0	55000.0	12505.0	70000.0	28959.2
SIGNING INSTALLATION	LF/DAY	LOW	8.7	750.0	3000.0	3000.0	1500.0	300.0	700.0	500.0	7650.0	150.0	600.0	1650.8
		AVERAGE	26.0	2500.0	5000.0	4500.0	4500.0	5700.0	2100.0	2000.0	7500.0	250.0	--	3407.6
		HIGH	26.0	4000.0	7000.0	8000.0	8000.0	10240.0	3500.0	3500.0	16500.0	500.0	1500.0	5706.0
THERMOPLASTIC PAVEMENT MARKING	LF/DAY	LOW	30.0	2467.0	2000.0	6000.0	3000.0	1000.0	4100.0	2500.0	9000.0	2035.0	5000.0	3375.6
		AVERAGE	115.0	14627.0	15000.0	15000.0	5000.0	2500.0	11600.0	8000.0	22500.0	4756.6	12000.0	10099.9
		HIGH	115.0	22500.0	30000.0	25000.0	10000.0	6000.0	13643.0	15000.0	14000.0	9285.0	16000.0	14685.7

TURF ESTABLISHMENT

ITEM	UNIT		DIST 1	DIST 2	DIST 3	DIST 4	DIST 5	DIST 6	DIST 7	DIST 8	DIST 9	DIST 10	AGC	AVG
SODDING	SY/DAY	LOW	--	1000.0	500.0	500.0	3300.0	900.0	--	300.0	1050.0	2000.0	1500.0	1227.8
		AVERAGE	2600.0	2000.0	1000.0	2000.0	4200.0	1700.0	400.0	1500.0	2225.0	3350.0	3000.0	2179.5
		HIGH	2800.0	2500.0	2000.0	3000.0	5000.0	30050.0	--	2000.0	3400.0	7000.0	5000.0	6275.0
SEEDING AND MULCHING	ACRES/DAY	LOW	5.0	4.0	4.0	3.0	5.0	2.0	3.5	2.0	8.0	3.0	4.0	4.0
		AVERAGE	15.0	9.0	10.0	5.0	8.0	3.0	9.1	6.5	14.0	4.8	10.0	8.6
		HIGH	20.0	11.0	15.0	10.0	17.0	12.0	12.5	12.0	22.0	6.3	18.0	14.2
PLANTING TREES 2"- 4" IN DIAMETER	EACH/DAY	LOW					20.0	180.0			30.0			76.7
		AVERAGE	N / A	N / A	N / A	N / A	40.0	398.0	N / A	N / A	115.0	N / A	N / A	184.3
		HIGH					80.0	612.0			200.0			297.3
PLANTING TREES GREATER THAN 4" IN DIAMETER	EACH/DAY	LOW					12.0	5.0			30.0			15.7
		AVERAGE	N / A	N / A	N / A	N / A	30.0	15.0	N / A	N / A	115.0	N / A	N / A	53.3
		HIGH					60.0	30.0			200.0			96.7
DITCH CHECKS	EACH/DAY	LOW	5.0	30.0	25.0	30.0	12.5	10.0	3.5	15.0	30.0	5.0	10.0	16.0
		AVERAGE	10.0	50.0	42.0	55.0	35.0	17.0	17.6	25.0	50.0	15.0	20.0	30.6
		HIGH	50.0	63.0	60.0	80.0	45.0	34.0	26.5	30.0	65.0	20.0	30.0	45.8
SILT FENCE	LF/DAY	LOW	100.0	1000.0	1017.0	2000.0	350.0	350.0	50.0	300.0	600.0	200.0	500.0	587.9
		AVERAGE	500.0	2500.0	1450.0	3000.0	900.0	560.0	525.0	500.0	1000.0	2000.0	2000.0	1357.7
		HIGH	1000.0	4000.0	1983.0	4000.0	1250.0	1420.0	1790.0	850.0	1200.0	2500.0	3000.0	2090.3

SIGNALS / LIGHTING

ITEM	UNIT		DIST 1	DIST 2	DIST 3	DIST 4	DIST 5	DIST 6	DIST 7	DIST 8	DIST 9	DIST 10	AGC	AVG
ELECTRIC CABLE	LF/DAY	LOW		375.0	450.0	300.0	500.0	200.0	802.5	200.0	1000.0	100.0		436.4
		AVERAGE	N / A	750.0	950.0	100.0	1500.0	1750.0	1377.5	700.0	3000.0	250.0	N / A	1153.1
		HIGH		2000.0	1500.0	200.0	2500.0	2500.0	1660.0	1000.0	5000.0	400.0		1862.2
CONDUIT - TRENCHED	LF/DAY	LOW		175.0	250.0	175.0	250.0	65.0	14.0	100.0	350.0	150.0		169.9
		AVERAGE	N / A	400.0	475.0	350.0	600.0	500.0	120.0	300.0	1725.0	487.5	N / A	550.8
		HIGH		975.0	675.0	800.0	780.0	800.0	225.0	500.0	3000.0	400.0		906.1
CONDUIT - PUSHED	LF/DAY	LOW		50.0	250.0	50.0	100.0	40.0	34.0	50.0	20.0	100.0		77.1
		AVERAGE	N / A	125.0	475.0	100.0	300.0	100.0	91.5	100.0	55.0	270.0	N / A	179.6
		HIGH		250.0	675.0	200.0	500.0	300.0	153.5	300.0	87.0	--		308.2
TRAFFIC SIGNAL HEAD	EACH/DAY	LOW		6.0	4.5	3.0	4.0	2.0	2.0	2.0	1.0	6.0		3.4
		AVERAGE	N / A	8.0	7.5	6.0	5.0	6.0	5.0	5.0	4.0	9.5	N / A	6.2
		HIGH		14.0	10.0	10.0	8.0	13.0	8.0	10.0	5.0	9.0		9.7
TRAFFIC SIGNAL / LIGHTING POST	EACH/DAY	LOW		2.0	2.5	1.0	2.0	3.0	1.0	2.0	1.0	2.0		1.8
		AVERAGE	N / A	3.0	5.5	3.0	3.0	8.0	1.3	4.0	3.0	3.5	N / A	3.8
		HIGH		5.0	7.5	4.0	5.0	10.0	1.5	6.0	4.0	4.0		5.2
DETECTOR LOOP	EACH/DAY	LOW		4.0	2.5	1.0	2.0	3.0	1.0	1.0	2.0	2.0		2.1
		AVERAGE	N / A	6.0	4.5	3.0	5.0	3.0	2.0	5.0	3.0	5.0	N / A	4.1
		HIGH		9.0	7.0	6.0	7.0	10.0	3.0	8.0	5.0	5.0		6.7
TRAFFIC SIGNALS (COMPLETE INSTALLATION)	DAYS/ INTERSECTION	LOW	60.0	30.0	3.0	60.0	20.0	15.0	7.0	22.0	17.0	--		26.0
		AVERAGE	20.0	20.0	2.0	30.0	15.0	10.0	5.5	20.0	11.0	20.5	N / A	15.4
		HIGH	6.0	10.0	1.0	10.0	10.0	8.0	4.0	18.0	7.0	--		8.2
PULL BOXES	DAYS/ INTERSECTION	LOW		4.0		6.0	6.0	10.0	4.0	4.0	4.0	4.0		5.3
		AVERAGE	N / A	3.0	N / A	4.0	4.0	6.0	2.5	2.0	3.0	2.5	N / A	3.4
		HIGH		3.0		2.0	2.0	5.0	1.0	1.0	2.0	2.0		2.3

PRODUCTION RATES

BRIDGE CONSTRUCTION (NEW)

ITEM	UNIT		DIST 1	DIST 2	DIST 3	DIST 4	DIST 5	DIST 6	DIST 7	DIST 8	DIST 9	DIST 10	AGC	AVG
SUBSTRUCTURE EXCAVATION	CY/DAY	LOW	0.1	2.0	100.0		1.0	50.0	17.0	8.0	3.0	0.2	0.1	18.1
		AVERAGE	0.5	3.5	500.0	N / A	2.0	142.0	32.0	15.0	6.0	2.0	1.0	70.4
		HIGH	2.0	7.0	1000.0		3.0	200.0	79.0	20.0	14.0	3.0	2.0	133.0
DRIVE PILING	LF/DAY	LOW	120.0	181.0	200.0	100.0	150.0	51.0	111.0	75.0	250.0	153.3	200.0	144.7
		AVERAGE	241.0	448.0	400.0	250.0	250.0	245.0	168.5	250.0	475.0	283.3	350.0	305.5
		HIGH	300.0	837.0	600.0	500.0	400.0	694.0	263.5	350.0	683.0	568.0	500.0	517.8
FOOTINGS, COLUMNS, & CAPS (3 COLUMN BENTS)	DAYS/EACH	LOW	10.0	7.0	10.0	30.0	10.0	12.0	17.0	14.0	11.0	7.6	10.0	12.6
		AVERAGE	6.0	6.0	7.0	20.0	9.0	6.0	13.0	10.0	9.0	5.8	8.0	9.1
		HIGH	3.0	6.0	3.0	15.0	9.0	6.0	9.0	7.0	8.0	4.5	5.0	6.9
BUILD ABUTMENTS	DAYS/EACH	LOW	12.0	4.0	12.0	5.0	10.0	8.0	7.5	8.0	5.0	9.0	4.0	7.7
		AVERAGE	6.0	3.0	9.0	3.0	9.0	6.0	6.5	6.0	3.0	8.0	3.0	5.7
		HIGH	3.0	3.0	5.0	2.0	9.0	4.0	5.5	4.0	3.0	7.5	2.0	4.4
P/S I-GIRDER ERECTION	DAYS/SPAN	LOW	3.0	1.5	3.0	3.0	2.0	5.0	2.5	3.0	2.0	0.8	2.0	2.5
		AVERAGE	2.0	0.8	2.0	2.0	2.0	2.0	1.8	2.0	1.0	0.8	1.0	1.6
		HIGH	0.3	0.5	1.0	1.0	2.0	1.0	1.0	1.0	1.0	0.8	0.5	0.9
STRUCTURAL DECK CONCRETE	CY/DAY	LOW	310.0	126.0	100.0	150.0	350.0	100.0	182.5	180.0	230.0	175.0	150.0	186.7
		AVERAGE	310.0	250.0	300.0	230.0	450.0	200.0	212.5	250.0	330.0	250.0	350.0	284.8
		HIGH	310.0	393.0	500.0	450.0	600.0	300.0	242.5	320.0	430.0	325.0	600.0	406.4
ERECTING STRUCTURE STEEL	LB/DAY	LOW		2500.0	35000.0	20000.0	20000.0	26000.0	106020.0	50000.0	25025.0	50000.0	100000.0	43454.5
		AVERAGE	N / A	7500.0	43000.0	30000.0	40000.0	50000.0	212040.0	300000.0	50037.0	145000.0	150000.0	102757.7
		HIGH		12500.0	50000.0	40000.0	60000.0	73000.0	318060.0	400000.0	75050.0	175000.0	200000.0	140361.0
TOTAL SUPERSTRUCTURE (STEEL BRIDGE)	DAYS/SPAN	LOW		16.0	5.0		12.0	15.0	12.0	21.0	8.0	24.0		14.1
		AVERAGE	N / A	13.0	3.0	N / A	8.0	12.5	9.0	15.0	6.0	18.0	N / A	10.6
		HIGH		10.0	2.0		6.0	10.0	6.0	8.0	4.0	12.0		7.3
TOTAL SUPERSTRUCTURE (P/S I-GIRDER)	DAYS/SPAN	LOW	10.0	10.0	3.0		10.0	15.0	9.0	13.0	8.0	10.5	18.0	10.7
		AVERAGE	8.0	8.0	2.0	N / A	6.0	4.0	7.5	10.0	6.0	8.0	15.0	7.5
		HIGH	6.0	5.0	1.0		4.0	3.0	6.0	6.0	4.0	5.5	14.0	5.5
SAFETY BARRIER CURB	LF/DAY	LOW	44.0	529.0	100.0	50.0	200.0	100.0	283.0	40.0	430.0	262.6	150.0	199.0
		AVERAGE	78.0	545.0	300.0	170.0	350.0	200.0	336.0	400.0	900.0	429.0	300.0	364.4
		HIGH	150.0	566.0	500.0	300.0	450.0	400.0	389.5	700.0	1260.0	620.0	500.0	530.5
BRIDGE APPROACH SLAB	DAYS/EACH	LOW	8.0	4.0	3.0	4.0	3.5	10.0	5.0	5.0	3.0	5.0	8.0	5.3
		AVERAGE	5.0	2.0	2.0	2.0	2.5	8.0	4.5	4.0	2.0	3.0	6.0	3.7
		HIGH	4.0	1.0	1.0	1.0	1.5	5.0	4.0	2.0	2.0	2.0	4.0	2.5
P/S PRE-CAST PANELS (ERECTING)	DAYS/SPAN	LOW	2.0	2.0	2.0	3.0	2.0	3.0	2.5	2.0	1.0	1.0	2.0	2.0
		AVERAGE	1.0	2.0	1.0	2.0	1.0	2.0	2.0	1.0	1.0	0.8	1.5	1.4
		HIGH	0.5	1.0	0.5	1.0	0.5	1.0	1.5	0.5	1.0	0.8	1.0	0.8
FINISHING, PAINTING, ETC.	DAYS/SPAN	LOW		5.0	7.0	3.0	3.5	3.0	3.0	6.0	5.0	2.0		4.2
		AVERAGE	N / A	3.0	5.0	2.0	2.0	2.0	2.5	4.0	3.0	1.8	N / A	2.8
		HIGH		2.5	3.0	1.0	1.0	2.0	2.0	2.0	1.0	0.5		1.7
FABRICATING & FURNISHING WIDE-FLANGE BEAM	DAYS/SPAN	LOW		4.0	50.0		30.0							28.0
		AVERAGE	N / A	2.5	7.5	N / A	20.0	N / A	N / A	N / A	N / A	N / A	N / A	10.0
		HIGH		1.0	2.5		15.0							6.2
FABRICATING & FURNISHING WELDED PLATE GIRDER	DAYS/SPAN	LOW		4.0	50.0		30.0							28.0
		AVERAGE	N / A	3.0	7.5	N / A	15.0	N / A	N / A	N / A	N / A	N / A	N / A	8.5
		HIGH		2.0	2.5		10.0							4.8
FABRICATING & FURNISHING P/S I-GIRDER	DAYS/SPAN	LOW		6.0	15.0		20.0							13.7
		AVERAGE	N / A	4.0	5.0	N / A	15.0	N / A	N / A	N / A	N / A	N / A	N / A	8.0
		HIGH		3.0	4.0		10.0							5.7
PREBORING EARTH	LF/DAY	LOW	105.0	100.0	50.0	50.0	50.0	100.0	40.0	50.0	163.0	60.0	200.0	88.0
		AVERAGE	133.0	200.0	200.0	100.0	200.0	150.0	52.5	300.0	366.0	125.0	300.0	193.3
		HIGH	133.0	300.0	300.0	200.0	300.0	400.0	65.0	450.0	550.0	200.0	400.0	299.8
PREBORING ROCK	LF/DAY	LOW		10.0	10.0	30.0	10.0	10.0		8.0	55.0	8.0	50.0	21.2
		AVERAGE	N / A	20.0	25.0	50.0	50.0	15.0	N / A	25.0	100.0	40.0	100.0	47.2
		HIGH		30.0	35.0	100.0	70.0	30.0		30.0	130.0	50.0	200.0	75.0
TEMPORARY BRIDGE ERECTING & DISMANTLING	DAYS	LOW		14.0				10.0			20.0	4.5	20.0	13.7
		AVERAGE	N / A	10.0	N / A	N / A	N / A	7.0	N / A	N / A	15.0	4.5	10.0	9.3
		HIGH		6.0				4.0			10.0	2.0	5.0	5.4

PRODUCTION RATES

BRIDGE RECONSTRUCTION

ITEM	UNIT		DIST 1	DIST 2	DIST 3	DIST 4	DIST 5	DIST 6	DIST 7	DIST 8	DIST 9	DIST 10	AGC	AVG
BRIDGE REMOVAL	SF/DAY	LOW		768.0	600.0		500.0	100.0	360.0	500.0	300.0	600.0	200.0	436.4
		AVERAGE	N / A	1070.0	1200.0	N / A	1000.0	1000.0	1275.0	700.0	600.0	1200.0	300.0	927.2
		HIGH		1370.0	2200.0		1500.0	2800.0	975.0	1000.0	700.0	1500.0	400.0	1382.8
REMOVE BRIDGE DECK	SF/DAY	LOW		800.0	493.0		500.0	850.0	2000.0	600.0	400.0	600.0	400.0	738.1
		AVERAGE	N / A	1600.0	1383.0	N / A	1000.0	913.0	3570.0	1000.0	800.0	1600.0	500.0	1374.0
		HIGH		2400.0	2000.0		1500.0	1259.0	5140.0	1300.0	900.0	2000.0	600.0	1899.9
MILL DECK (1/4")	SF/DAY	LOW		10000.0	680.0	2000.0	2000.0	350.0		550.0	400.0	6000.0	1000.0	2553.3
		AVERAGE	N / A	30000.0	1530.0	10000.0	3000.0	800.0	N / A	1100.0	600.0	6000.0	2000.0	6114.4
		HIGH		40000.0	2105.0	15000.0	4000.0	1250.0		1650.0	1000.0	6000.0	3000.0	8222.8
ASPHALT OVERLAY	SF/DAY	LOW		10000.0	1723.0	1600.0	1000.0	500.0		100.0		750.0	500.0	2021.6
		AVERAGE	N / A	25000.0	2753.0	8000.0	2000.0	1200.0	N / A	2500.0	N / A	2000.0	800.0	5531.6
		HIGH		40000.0	4123.0	24000.0	3000.0	2000.0		3200.0		3000.0	4000.0	10415.4
LOW SLUMP OVERLAY	SY/DAY	LOW		500.0	372.0	170.0	500.0	500.0		500.0	125.0	500.0	300.0	385.2
		AVERAGE	N / A	800.0	763.0	500.0	1000.0	1200.0	N / A	1000.0	200.0	1000.0	300.0	751.4
		HIGH		1000.0	1133.0	1200.0	1500.0	2000.0		1200.0	400.0	1250.0	300.0	1109.2
POLYMER CONCRETE OVERLAY	SF/DAY	LOW		2940.0	342.0	1500.0	400.0	1000.0	345.0	400.0		3000.0		1240.9
		AVERAGE	N / A	2940.0	720.0	5000.0	700.0	8000.0	465.0	600.0	N / A	5000.0	N / A	2928.1
		HIGH		2940.0	1067.0	10000.0	1000.0	15000.0	580.0	800.0		7000.0		4798.4
MEMBRANE WATERPROOFING	SF/DAY	LOW		2000.0	7524.0		4000.0	1000.0	3000.0	800.0		5000.0		3332.0
		AVERAGE	N / A	4500.0	11320.0	N / A	6000.0	8000.0	3000.0	2000.0	N / A	7000.0	N / A	5974.3
		HIGH		5500.0	14817.0		8000.0	15000.0	3000.0	3500.0		9200.0		8431.0
EXPANSION JOINT REPLACEMENT	LF/DAY	LOW		4.0	10.0	48.0	25.0	50.0		35.0		4.0	20.0	28.0
		AVERAGE	N / A	7.5	20.0	60.0	40.0	200.0	N / A	55.0	N / A	6.0	30.0	59.8
		HIGH		10.0	30.0	120.0	70.0	400.0		75.0		8.0	50.0	109.0
RAILING RECONSTRUCTION	LF/DAY	LOW		2.5	55.0		100.0	100.0		50.0			10.0	52.9
		AVERAGE	N / A	60.0	88.0	N / A	200.0	200.0	N / A	200.0	N / A	N / A	18.0	127.7
		HIGH		90.0	128.0		300.0	300.0		250.0			20.0	181.3
REPLACE OR WIDEN BRIDGE DECK	SF/DAY	LOW		50.0	172.0		200.0	50.0				100.0		114.4
		AVERAGE	N / A	125.0	433.0	N / A	400.0	200.0	N / A	N / A	N / A	200.0	N / A	271.6
		HIGH		175.0	633.0		600.0	375.0				250.0		406.6
PRESTRESS CONCRETE BEAMS	LF/DAY	LOW	80.0	100.0	90.0	50.0	150.0	250.0	260.0	100.0	325.0		320.0	172.5
		AVERAGE	160.0	150.0	205.0	200.0	300.0	520.0	390.0	700.0	462.0	N / A	520.0	360.7
		HIGH	160.0	200.0	310.0	500.0	600.0	700.0	520.0	800.0	650.0		720.0	516.0
REINFORCEMENT BARS (SUBSTRUCTURE)	LB/DAY	LOW	2000.0	5000.0	335.0	250.0	3000.0	2620.0	500.0	700.0	1000.0	2000.0	680.0	1644.1
		AVERAGE	4000.0	10000.0	565.0	1200.0	5000.0	9595.0	1000.0	2500.0	4000.0	6400.0	780.0	4094.5
		HIGH	5100.0	15000.0	850.0	2500.0	9000.0	16570.0	4130.0	4000.0	6000.0	15000.0	880.0	7184.5
REINFORCEMENT BARS (SUPERSTRUCTURE)	LB/DAY	LOW	3000.0	6000.0	567.0	1000.0	4000.0	3000.0	--	5000.0	6000.0	3000.0	1600.0	3316.7
		AVERAGE	8500.0	13000.0	1213.0	3000.0	6000.0	17250.0	2500.0	12000.0	14000.0	6000.0	1700.0	7742.1
		HIGH	10000.0	20000.0	1817.0	5000.0	10000.0	38000.0	17190.0	17000.0	20000.0	8000.0	1800.0	13527.9
CONCRETE DECK REPAIR (HALF SOLING)	SF/DAY	LOW		100.0		50.0	50.0	25.0		15.0	50.0	20.0	100.0	51.3
		AVERAGE	N / A	150.0	N / A	115.0	150.0	75.0	N / A	50.0	137.0	40.0	200.0	114.6
		HIGH		300.0		300.0	200.0	150.0		130.0	200.0	50.0	500.0	228.8
CONCRETE DECK REPAIR (FULL DEPTH)	SF/DAY	LOW		50.0		30.0	25.0	20.0		10.0	42.0	30.0	50.0	32.1
		AVERAGE	N / A	150.0	N / A	50.0	75.0	50.0	N / A	30.0	65.0	60.0	100.0	72.5
		HIGH		200.0		150.0	100.0	100.0		40.0	85.0	80.0	200.0	119.4
BRIDGE SLAB EDGE REPAIR	LF/DAY	LOW		25.0	20.0	30.0	25.0	15.0			20.0	30.0	50.0	26.9
		AVERAGE	N / A	50.0	50.0	100.0	50.0	40.0	N / A	N / A	35.0	50.0	75.0	56.3
		HIGH		150.0	70.0	150.0	75.0	70.0			50.0	70.0	80.0	89.4
UNFORMED SUPERSTRUCTURE REPAIR	SF/DAY	LOW		25.0		20.0	50.0	40.0			20.0	50.0	20.0	32.1
		AVERAGE	N / A	50.0	N / A	40.0	100.0	100.0	N / A	N / A	35.0	75.0	30.0	61.4
		HIGH		75.0		75.0	150.0	150.0			50.0	100.0	50.0	92.9
UNFORMED SUBSTRUCTURE REPAIR	SF/DAY	LOW		50.0		20.0	30.0	30.0			20.0	50.0	20.0	31.4
		AVERAGE	N / A	75.0	N / A	30.0	60.0	60.0	N / A	N / A	35.0	75.0	30.0	52.1
		HIGH		100.0		50.0	100.0	100.0			50.0	150.0	50.0	85.7
MECHANICALLY STABILIZED EARTH WALL	SF/DAY	LOW		75.0			300.0	800.0			20.0	--		298.8
		AVERAGE	N / A	100.0	N / A	N / A	500.0	1000.0	N / A	N / A	60.0	373.0	N / A	406.6
		HIGH		150.0			600.0	2500.0			100.0	--		837.5

PRODUCTION RATES

DAYS BASED ON NUMBER OF SPANS & DEGREE OF DIFFICULTY

ITEM	UNIT		DIST 1	DIST 2	DIST 3	DIST 4	DIST 5	DIST 6	DIST 7	DIST 8	DIST 9	DIST 10	AGC	AVG
TWO SPANS	DAYS	LOW			51.0	150.0	35.0	50.0		120.0	20.0			71.0
		AVERAGE	N / A	N / A	32.5	120.0	30.0	40.0	N / A	--	15.0	N / A	N / A	47.5
		HIGH			25.5	90.0	20.0	30.0		60.0	10.0			39.3
THREE SPANS	DAYS	LOW	103.0	66.0	74.0		45.0	55.0	--	80.0	24.0	50.0		62.1
		AVERAGE	103.0	58.0	49.5	N / A	35.0	45.0	65.0	65.0	18.0	40.0	N / A	53.2
		HIGH	103.0	50.0	39.0		25.0	35.0	--	40.0	12.0	32.0		42.0
FOUR SPANS	DAYS	LOW			100.0		55.0	60.0	--	120.0	27.0			72.4
		AVERAGE	N / A	N / A	68.5	N / A	45.0	50.0	257.0	--	21.0	N / A	N / A	88.3
		HIGH			50.0		30.0	40.0	--	75.0	15.0			42.0

MOBILIZATION / DEMOBILIZATION (TOTAL FOR BOTH)

ITEM	UNIT		DIST 1	DIST 2	DIST 3	DIST 4	DIST 5	DIST 6	DIST 7	DIST 8	DIST 9	DIST 10	AGC	AVG
GRADING	DAYS	LOW	1.0	1.0	3.0	2.0	4.0	10.0	2.0	10.0	60.0	1.5	4.0	9.0
		AVERAGE	3.5	3.0	6.0	2.5	5.0	8.0	3.0	30.0	90.0	2.0	10.0	14.8
		HIGH	6.0	5.0	10.0	3.0	10.0	6.0	4.0	50.0	120.0	3.0	15.0	21.1
BITUMINOUS PAVING	DAYS	LOW	1.0	1.0	1.0	1.0	4.0	6.0	3.0	5.0	40.0	1.0	1.0	5.8
		AVERAGE	1.0	3.0	2.0	2.0	8.0	4.0	4.0	10.0	50.0	1.0	2.0	7.9
		HIGH	1.0	5.0	3.0	3.0	15.0	2.0	5.0	15.0	60.0	1.0	6.0	10.5
PORTLAND CEMENT PAVING	DAYS	LOW	1.0	2.0	8.0	3.0	5.0	6.0	6.0	20.0	20.0	12.5		8.4
		AVERAGE	2.5	4.0	10.0	4.0	7.0	5.0	7.0	40.0	50.0	17.5	N / A	14.7
		HIGH	4.0	6.0	20.0	6.0	15.0	4.0	8.0	50.0	80.0	20.0		21.3
GRADING & PAVING (P.C.C.)	DAYS	LOW	1.0	3.0	10.0	5.0	2.0	10.0	3.0	30.0	80.0	10.0		15.4
		AVERAGE	3.0	5.0	12.0	6.0	4.0	8.0	8.0	70.0	100.0	15.0	N / A	23.1
		HIGH	5.0	8.0	20.0	8.0	6.0	6.0	9.5	100.0	120.0	25.0		30.8
GRADING & PAVING (BIT.)	DAYS	LOW	2.0	2.0	6.0	5.0	1.0	10.0	3.0	15.0	60.0	1.5	6.0	10.1
		AVERAGE	2.0	4.0	8.0	6.0	1.0	8.0	4.0	40.0	90.0	2.0	16.0	16.5
		HIGH	2.0	6.0	10.0	8.0	2.0	6.0	5.0	65.0	120.0	3.0	31.0	23.5
GRADING, PAVING (BIT.) & BRIDGES	DAYS	LOW		4.0	10.0	5.0	1.0	14.0	4.0	60.0	80.0	7.0	12.0	19.7
		AVERAGE	N / A	6.0	12.0	7.0	0.5	12.0	5.0	90.0	100.0	7.0	26.0	26.6
		HIGH		10.0	22.0	10.0	0.5	10.0	6.0	100.0	120.0	8.0	40.0	32.7
GRADING, PAVING (P.C.C.) & BRIDGES	DAYS	LOW	5.0	4.0	12.0	5.0	1.0	14.0	6.0	70.0	100.0		12.0	22.9
		AVERAGE	8.5	8.0	15.0	7.0	1.0	12.0	7.0	110.0	110.0	N / A	26.0	30.5
		HIGH	12.0	12.0	25.0	10.0	2.0	10.0	8.0	125.0	120.0		40.0	36.4